CLAIMS

What is claimed is:

1. A method of automatically mapping network addresses of a first protocol for a plurality of network elements in a first network to network addresses of a second protocol, comprising the steps of:

defining a table maintained in each network element of the plurality of network elements;

assigning an identifier within the first protocol for each network element of the plurality of network elements;

assigning an address corresponding to the second protocol for each network element of the plurality of network elements;

associating the first protocol identifier with the address corresponding to the second protocol within the table for each network element of the plurality of network elements; and

associating an update timer with each protocol identifier for each network element in the first network.

2. The method of claim 1 further comprising the step of

propagating the first network protocol identifier from each network element at periodic intervals;

resetting the update timer associated with each network element upon propagation of a first network protocol identifier from that network element; and

removing a network element from the table if the update timer for that network element reaches a pre-determined count value.

3. The method of claim 2 further comprising the step of defining a port number for each network element in the first network.

4. The method of claim 3 wherein the first network is coupled to a second network, the method further comprising the step of associating a port number with the network to which the network element is coupled.

5. The method of claim 2 wherein the first network is configured in a ring topology.

6. The method of claim 2 wherein the first network is a point-to-point network.

7. The method of claim 5 wherein the first network is a SONET ring network and the first network protocol comprises the Internet protocol operating over a SONET Data Communications Channel protocol.

8. The method of claim 2 further comprising the step of maintaining a status of each network element is in the table.

9. The method of claim 2 wherein the status of each network element comprises one of new node, updated node, and deleted node.

10. A method of associating a network address of a network element within a SONET ring network to a second network utilizing Internet Protocol addressing, the method comprising the steps of:

assigning a Transport Identifier address to each network element with the SONET network;

advertising an Internet Protocol address of a gateway node coupling the SONET network to the second network;

transmitting a message to the gateway node, the message including a Transport Identifier address of the network element to be accessed;

maintaining a table in the gateway node that specifies respective Transport Identifier addresses with associated Internet Protocol addresses for each network element within the SONET network;

transmitting the message to the network element whose Internet Protocol address corresponds to the transmitted Transport Identifier address.

11. The method of claim 10 further comprising the steps of:

associating an update timer with each network element in the SONET ring network;

resetting the update timer associated with each network element upon propagation of a Transport Identifier address from that network element; and

removing a network element from the table if the update timer for that network element reaches a pre-determined count value.

12. The method of claim 11 wherein the SONET ring network implements an Internet protocol operating over a SONET Data Communications Channel protocol.

13. The method of claim 11 further comprising the step of maintaining a status of each network element is in the table.

14. The method of claim 13 wherein the status of each network element comprises one of new node, updated node, and deleted node.

15. The method of claim 14 wherein the table comprises a plurality of entries including node Transport Identifier address, Internet Protocol address, and status information for each network element in the SONET ring network.